CLAIMS

1. Plant for urea production from ammonia and carbon dioxide having a so-called high-pressure section which comprises a synthesis reactor and a condensation unit (7, 107) positioned inside said reactor, all substantially operating at the same pressure, characterised in that said condensation unit (7, 107) comprises a plurality of flattened plate-shaped essentially rectangular heat exchangers (17, 117, 123), arranged with long sides (17a, 117a, 123a) parallel to the axis of said reactor (1).

2. Plant according to claim 1, characterised in that each of said exchangers (17, 117, 123) comprises a pair of juxtaposed metallic plates (18, 19; 118, 119), joined together by perimetric weldings so as to define a chamber (21, 121, 125) of predetermined width between them.

3. Plant according to claim 2, characterised in that said plates (18, 19) are also joined together through a plurality of welding points (18a) defining in said chamber (21) a plurality of winding paths in fluid communication with each other and with conectors (22, 23) for the entry and exit, respectively, of a heat exchange fluid into and from the respective heat exchanger (17), said connectors (22, 23) being provided for on opposite sides of said exchangers (17).

4. Plant according to claim 3, characterised in that said welding points (18a) are distributed in groups of five.

5. Plant according to claim 3, characterised in that the entry and exit connectors (22, 23) of all of the exchangers (17) are connected to respective ducts (24, 26) for distributing and collecting the heat exchange fluid

entering and respectively exiting from said exchangers (17), respectively.

6. Plant according to claim 2, characterised in that each of said exchangers (117) comprises at least one distributor duct (31) and at least one collector duct (32) of an operating heat exchange fluid, associated with two respective opposite sides (117a) of said exchanger (117) and extending along them, said ducts (31, 32) being in fluid communication on one side with said chamber (121) through at least one opening (31a, 32a) formed in them and, on the other side, with the outside of said exchanger (117), through respective connectors (33, 34) for the entry and exit of said operating fluid, positioned on a same short side (117b) of the exchanger (117).

7. Plant according to claim 6, characterised in that said ducts (31, 32) consist of respective tubes, positioned in said chamber (121) and fixed to said opposite long sides (117a) of the exchanger (117).

8. Plant according to claim 7, characterised in that said ducts (31, 32) are directly formed in correspondence with said long sides (117a) at the time of the forming of the exchanger.

9. Plant according to claim 2, characterised in that said chamber (121) is subdivided into a plurality of chambers (121a) not directly communicating with each other, each of which is in fluid communication with said distributor duct (31) and with said collector duct (32), through respective openings (31a, 32a) formed in them.

10. Plant according to claim 9, characterised in that said chambers (121a) are obtained through welding lines (121b)

of said metallic plates, extending perpendicularly to said ducts (31, 32).

11. Plant according to claim 10, characterised in that each of said chambers (121a) is internally equipped with a plurality of deflector plates (122), extending parallel to said ducts (31, 32) and defining a substantially winding path for said operating fluid.

12. Plant according to claim 1 and according to any one of claims 2 to 11, characterised in that said condensation unit has a substantially annular cylindrical configuration, crossed axially by a passage (14) with a predetermined diameter, in which said plurality of heat exchangers (17, 117, 123) are distributed in many coaxial and concentric rows, in a substantially radial arrangement.

13. Plant according to claim 2, characterised in that at least one of said exchangers (123) is internally equipped with a separator plate (124), extending from one side (123c) of said exchanger (123), towards a side (123b) opposite it and from which said plate (124) is in a predetermined distanced relationship, said plate (124) defining in said chamber (125) a substantially U-shaped fluid path having descending and ascending portions (125a, 125b), respectively, in communication with the outside of the exchanger through respective connectors (126, 127).

14. Plant according to claim 13, characterised in that said separator plate (124) extends in said chamber (125) in a direction forming an angle with said side (123c), for which reason the portions (125a, 125b) of said fluid path inside the exchanger (123) have a gradually increasing cross-section.

15. Plant according to any one of the previous claims, characterised in that said exchangers (17, 117, 123) have predetermined cross sections of less than the cross sections of a manhole opening arranged in correspondence with a base plate of said reactor.